



UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/327,469	06/08/99	YAMAZAKI	S 0756-1982

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EXAMINER

PERALTA, G

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 03/28/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/327,469

Applicant(s)

YAMAZAKI, SHUNPEI

Examiner

Ginette Peralta

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 January 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 6-13 and 20-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 6-13 and 20-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 18) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 20 is objected to because of the following informalities: The claim language is not consistent throughout the claim, first referring to "an amorphous semiconductor film", then to "said semiconductor film", then returning to "said amorphous semiconductor film". Appropriate correction is required.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
2. Claim 2 recites the limitation "said amorphous silicon film" in line 6. There is insufficient antecedent basis for this limitation in the claim.
3. Claim 3 recites the limitation "said amorphous silicon film" in line 9. There is insufficient antecedent basis for this limitation in the claim.
4. Claim 9 recites the limitation "the pulse width" in line 2. There is insufficient antecedent basis for this limitation in the claim.
5. Claim 10 recites the limitation "the laser energy density" in line 2. There is insufficient antecedent basis for this limitation in the claim.
6. Claim 21 recites the limitation "said amorphous semiconductor film" in line 5. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-3,6-13, 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al. (U.S. Pat. 5,830,784) in view of Zhang et al. (U.S. Pat. 5,569,610) and Otani et al. (JP 9312260 A).

Zhang et al. ('784) teaches a method of manufacturing a semiconductor device that comprises a forming a semiconductor film 603, holding a catalytic element that promote the crystallization of the semiconductor film in contact with the semiconductor film, irradiating a laser beam to the semiconductor film to crystallize the semiconductor film, forming an oxide film on the surface of the crystalline semiconductor film, and selectively adding phosphorus or boron to the crystalline semiconductor film. Wherein the film 603 is an amorphous silicon film, and the catalytic element is one of Pb, Fe, Pt, Co, and Ni.

Zhang et al. ('784) teaches the limitations in the claims with the exception of gettering the catalytic element by the addition of phosphorus or boron or through the oxide layer.

Zhang et al. ('610) teaches a method of manufacturing a semiconductor device that comprises forming a semiconductor film, holding a catalytic element which promotes the crystallization of the semiconductor film, irradiating a laser beam; wherein the laser energy density of the laser beam is 200 to 500 mJ/cm².

Otani et al. teaches a method of manufacturing a semiconductor device that comprises a metal element film which promotes crystallization being introduced into an amorphous silicon film, the silicon film is crystallized by a heat treatment, then a second heat treatment is performed in an oxidizing atmosphere and the metal element is removed or reduced, then the thermal oxidation film is removed and a thermal oxidation film is formed on the surface of the silicon film.

Thus, it would have been within the scope of one of ordinary skill in the art to vary the ranges of the properties of the laser beam in order to obtain a faster crystallization or a more defined crystallization without any unexpected results, and to form a thermal oxidation layer as Otani et al. teaches for the removal of the crystallization promoting element, and that it would be an inherent result of the annealing after the doping with phosphorus or boron that the crystallization promoting element will go through a gettering process and will be removed from the crystallized silicon layer.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ginette Peralta whose telephone number is (703)305-7722. The examiner can normally be reached on Monday to Friday 8:00 AM-4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (703)306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7722 for regular communications and (703)308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

GP
March 23, 2001


Olik Chaudhuri
Supervisory Patent Examiner
Technology Center 2800